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MALNUTRITION AND SCHOOL FEEDING

By

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MALNUTRITION AND SCHOOL FEEDING.

INTRODUCTION.

One of the most conspicuous by-products of the public-school system is a quickened interest in the physical welfare of the school child. Practically the entire population of the Nation between the ages of 5 and 15 is gathered together for from 6 to 10 months of the year into a great community to receive public instruction. This segregation of the youth of the Nation is beset, from the point of view of public health, with advantages and disadvantages. The chief disadvantages are that the close personal contact of so many individuals facilitates the spread of contagious disease and that the educational process itself places a severe physical strain on growing children. The chief advantages are that it facilitates the regulation of health conditions and that it brings to the attention of the proper authorities physically subnormal children who would otherwise remain undiscovered.

Malnutrition is a term used to indicate a general condition of less than normal physical and mental vigor (*25*Q.) While the causes of malnutrition are many, incorrect or inadequate diet appears all too often as one of the causes; hence school feeding, which affords not only an opportunity to supplement the home food supply but also to teach correct food habits, becomes a most valuable agency in combating the evil.

This monograph is presented with a desire to aid communities in making school feeding a really effective social agency. In order to determine the true relation between malnutrition and school feeding, we shall first consider briefly the problem of malnutrition and, second, the development and present status of school feeding both in New York City and other communities in relation to this defect.

MALNUTRITION.

Malnutrition has received most careful study in Great Britain; and it is to Great Britain, therefore, that we must turn for the most authoritative and convincing statements on the subject. Nowhere have the difficulties inherent in the problem been more clearly stated than in the report of Sir George Newman, chief medical officer of the board of education of England (*23*):

> Sound nutrition is a general physiological condition which connotes a healthy body in all respects and the good tone and health of its various constituent parts, its brain and nervous system, its muscular, digestive, circulatory, and lymphatic systems. All this means that we must take a wide and comprehensive view of nutrition, which is a state revealing itself in a variety of signs and symptoms. Thus, in endeavoring to estimate a child's nutrition or its opposite (viz, malnutrition), we must think not only of bulk and weight of body, but of ratio of stature to weight; of the general balance and "substance" of the body and of its carriage and bearing; of the firmness of the tissues; of the presence of subcutaneous fat; of the condition and process of the develop-

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[1] Reference is made by number (italic) to "Bibliography," p. 38.

ment of the muscular system; of the condition of the skin and the redness of the mucous membranes; of the nervous and muscular system as expressed in listlessness or alertness, in apathy or keenness; of the condition of the various systems of the body, and, speaking generally, of the relative balance and coordination of the functions of digestion, absorption, and assimilation of food as well as of the excretion of waste products. It is obvious that these are data which are likely to lead to a much more reliable opinion than the consideration of any one factor or ratio, however expeditiously obtained or convenient in form or practice, and these data will demand a wider as well as a more careful and accurate observation of the whole physique of the child. Nor can an ultimate opinion always be formed at one inspection at any given moment. For nutrition, like its reverse, malnutrition, is a process and not an event. In regard to diagnosis, therefore, the school medical officer has as yet neither an absolute standard of nutrition nor a single criterion to guide him. He must form a considered and careful opinion on all the facts before him.

ANTHROPOMETRIC METHOD OF DIAGNOSIS.

The anthropometric method of determining malnutrition is the one most widely used, and in many cases it is used exclusively. Since malnutrition almost invariably manifests itself in retarded growth, and since the child's height and weight may readily be determined with respect to the normal measurements for his years, this method makes a strong appeal to school medical inspectors who have not the necessary time to make thorough examinations, and may even be resorted to by those without medical training. It appears that the child's height is less affected by his nutrition than his weight, and there is, therefore, a strong preference for comparing the child's weight with the normal weight for a child of his height, rather than with the normal weight for his age. Height is to some extent influenced by nutrition, hence children who are much under height for their age ought to be regarded as suspected cases of malnutrition unless there is a known inheritance of small stature.

But deviation from the normal or average rate of growth is not in itself an infallible index of the child's nutrition. Height and weight are determined by heredity factors as well as those of nutrition. The method has value only as a rough sorting out of children apparently in need of nutritional care and is in no sense a substititution for a thorough medical examination where this is possible.

THE GRADING OF NUTRITIONAL DEFECTS.

The defect is relative. Children can not be divided into two mutually exclusive classes, the well nourished and the poorly nourished, for the attempt to do so results in an arbitrary division of border-line cases. Dr. Alister MacKenzie, of Dunfermline, Scotland, has worked out a practical method of classification, known as the "Dunfermline scale." (*18*) According to this scale all children are divided, with respect to their nutrition, into four groups, as follows:

(1) "Excellent" means the nutrition of a healthy child of good social standing.

(2) Children whose nutrition just falls short of this standard are "good."

(3) Children "requiring supervision" are on the border line of serious impairment.

(4) Children "requiring medical treatment" are those whose nutrition is seriously impaired.

THE EXTENT OF MALNUTRITION.

CONFLICTING DATA.

Since there is in operation no uniform method of diagnosis of the defect of malnutrition, it is not surprising to find a great disparity in the statistics regarding it. Indeed, the estimates of the prevalence of the defect run from 1 per cent to 50 per cent of the school population in communities which are similar in most other respects. One must look with suspicion, therefore, on all estimates or statistics until one has ascertained something of the method of diagnosis and classification. Observers who are relatively inexperienced in dealing with the defect are likely to recognize only the most marked cases; i. e., cases of virtual starvation. The number reported by such observers is, therefore, comparatively small. Under careful and accurate methods of diagnosis, however, which recognize degrees of the defect, a large number is usually called to attention. This is clearly illustrated in the case of New York City. In that city, before the adoption of the Dunfermline scale, the average annual percentage of school children reported by the department of health as undernourished was 4 per cent, while in 1916, the year of the adoption of the Dunfermline method, 15 per cent was reported. As it is unbelievable that malnutrition has actually increased to that extent, we must assume that the apparent increase was due to better methods of diagnosis and classification. It is likely, however, that the proportion of malnutrition found in New York City is fairly indicative of that present in most cities with a large industrial population.

DATA OF CAREFUL OBSERVERS.

At the present stage a rough estimate of the extent of malnutrition based on the reports of those authorities who have been most thorough and careful in their methods and in their grasp of the problem is much more satisfactory than conflicting reports from various localities. In Great Britain, where the grading system is universally in vogue, the percentage of school children who are reported as undernourished runs froom 10 to 30 per cent. In 1912 London reported 9.3 per cent of its children as undernourished, while in 1918 from 4.4 to 7.2 per cent, according to age grouping, were placed in that class. Bradford reported 16.2 per cent of the children attending its schools in 1914 as below normal and of bad nutrition. Dr. Alister MacKenzie reported 33⅓ per cent for Edinburgh. Dr. S. Josephine Baker, director of the bureau of child hygiene of the New York health department, reported 20 per cent as the proportion of malnutrition among New York City children for the year 1917–18.

Studies of small groups, when conducted with greater care than is usually possible with larger ones, are of great value as an index to the situation in the entire community. Such a study was recently made by the bureau of child hygiene of the department of health of New York City and the New York Association for Improving the Condition of the Poor. It was found that among the 2,535 children examined one-third (33.8 per cent) were undernourished.

ESTIMATES IN THE UNITED STATES.

On the meager data at our disposal it would be hazardous to attempt to estimate the number of children of school age in the entire country who are suffering from malnutrition. In 1904 Robert Hunter, in his book, "Poverty," estimates that there were 3,300,000 undernourished school children in the

United States. About the same time other estimates appeared which were a little more conservative. Spargo estimated that there were 2,000,000 undernourished children, while Dr. Sill placed the figure at 1,472,896. As we have seen, conservative estimates of the extent of malnutrition of various communities of the country run from 5 to 20 per cent. If this proportion holds true for the entire country, it would mean that from 1,000.000 to 4,000,000 children in our public schools are suffering from defective nutrition.

CAUSES OF DEFECTIVE NUTRITION.

The chief causes of malnutrition are poverty, ignorance, and disease. A great deal of confusion has arisen in the attempt to assign a definite value to each factor. The three factors are usually interwoven and the fact that ignorance and disease are more prevalent among the poor than among the well-to-do has led many to conclude that poverty is the chief or sole cause of defective nutrition. The mistake has been to use the term poverty in the widest sense to include all the usual concomitants of property—overworking, low standards of hygiene, as well as the mere lack of food (*11*).

It is, of course, difficult to determine exactly to what extent the inadequate supply of food even among poor families is due to insufficient income. Chapin's "Standard of Living of Workingmen's Families" throws considerable light on this phase of the subject. The weekly purchases of food of 391 families were submitted to food experts who determined whether or not they were adequate. The "underfed" families were then compared on the basis of yearly income with the following results:

Relation between income and underfeeding in American workingmen's families.

Annual income.	Total number of families.	Underfed families.	
		Number.	Per cent.
$400 to $599	25	19	76
$600 to $799	151	48	32
$800 to $899	73	16	22
$900 to $1,099	94	8	9
$1,100 and over	48	0	0
Total	391	91	23.2

The table clearly indicates a remarkably higher rate of underfeeding among the lower income groups. Miss Gillett's studies in the same field have substantiated the conclusions of Dr. Chapin (*26*). She discovered, further, that important foods, such as milk, eggs, and fresh vegetables, are more likely to be lacking among the poorer groups because they are regarded as too expensive. This tendency, however, is due as much to ignorance as to inadequate income.

Ignorance of food values and the rudiments of hygiene tend to fix family habits which are bound to retard the physical development of the child. The tea and coffee habit, lack of proper sleep, fresh air, and exercise, and the use of sweet and starchy food to the exclusion of protein foods and those containing mineral salts and vitamins, often have their origin in ignorance. With the immigrant population the situation is aggravated by faulty adjustment to the American food supply. Such families find that the food they have been accustomed to in the old country is either not available at all or prohibitive in cost, while American foods, which are cheaper and quite as nutritious, do not appeal to them. The adjustment is a sort of compromise which is far from satisfactory from the point of view of nutrition.

It is definitely known that certain diseases and physical defects adversely affect the child's nutrition. Serious illness in early childhood, intestinal parasites, toxic poisoning from defective teeth, tonsils, and adenoids, tuberculosis, and venereal diseases all tend to interfere with the processes of digestion and assimilation.

THE EFFECTS OF MALNUTRITION.

The most immediate effects of malnutrition are a stunted physique and a lowered resistance to disease. Dr. Holt says, "The undernourished child takes everything." Measles, scarlet fever, and tuberculosis make their most deadly inroads among children whose vitality is below normal. Malnutrition, except, of course, in its extreme form of actual starvation, seldom directly results in death. This fact may explain to some extent why the defect has only so lately aroused the serious concern of public-health authorities. But, as a prelude to diseases which often are fatal in character, its deadly effect is none the less real.

Malnutrition is often a cause of poor teeth and defective vision, just as poor teeth and defective vision may react upon the general health of the child. The inadequate supply of improper assimilation of mineral substances deprives the bones and the teeth of their proper strength. Bad teeth result in the secretion of certain poisons and in poor digestion, which are themselves prolific causes of malnutrition.

Malnutrition is of the deepest concern to educators because of the effect it has in retarding the child's progress in school. This takes place chiefly in two ways: First, in absences from school because of physical defects; and, second, in the failure of the child to react properly to the stimuli of the classroom even when he is present. A study recently made of undernourished children in the schools of New York City indicated that there was an advantage of between 3 and 4 per cent in grade progress of the children of better nutrition as against those of poor nutrition.

The defect has a serious economic aspect also. A child with a poor physique and an inadequate mental equipment is poorly fitted for the economic struggle. Malnutrition, therefore, frequently results in poverty, while, as we have seen, poverty is a cause of malnutrition. A vicious circle is established, leading from poverty to malnutrition and from malnutrition back to poverty.

A BRIEF HISTORY OF SCHOOL FEEDING.

Interest in this subject has generally taken three forms: An emotional, an educational, and a public-health interest. The emotional interest has usually appeared first and has been the least productive of results. The educational and public-health interests have appeared later and practically simultaneously.

School feeding has often started as a sympathetic response on the part of the community to the spectacle of thousands of ill-nourished children in the public schools. The natural impulse has been to feed these children with little thought of the final results of such a procedure.

Interest in the subject developed among educators because they have realized that to attempt to educate children whose minds and bodies were stunted for lack of proper food was a heavy drain on the entire educational system. While they realized that school feeding could not be expected to restore all children to a condition of sound health, it offered one approach to the solution of the problem of malnutrition.

Broad-minded educators have also seen another possibility in school feeding which might be called its educational aspect. They saw a possibility in the serving of school meals under proper conditions of educating the children, and through them the family, in food economy and personal hygiene, as well as imparting some of the common amenities of life to those who would otherwise not receive them. The school they regarded as the logical place for carrying on such work.

The public-health interest has developed almost simultaneously with the educational interest. The two points of view have much in common. As investigations show malnutrition to be an important factor in racial degeneration, any proposal which promises to aid in any way in the control of this menace makes a strong appeal to those groups who are chiefly interested in the conservation of human life.

THE ENGLISH MOVEMENT.

Nowhere has school feeding been done on such an extensive scale and nowhere has it been accorded such strong popular approval as in England (*4*). Since the public elementary schools of England have heretofore been the schools of those too poor to send their children elsewhere, it is not surprising that the malnutrition existing among these children should be closely associated with the poverty of their parents.

School feeding began in England as an emotional response on the part of groups of sympathetic and charitable persons to real suffering among school children. The education act of 1870, which enforced school attendance, was largely responsible for the initiation of the movement. The gathering together of the poor children of the nation in the public schools brought to notice thousands of sickly and emaciated children who would otherwise have remained hidden in the slums of great cities. It was also soon discovered that the strain of school life was more than many of their feeble bodies could bear. A large number of volunteer feeding societies sprang into existence to meet this need. It has been stated on good authority that in 1905 there were 355 separate organizations for school feeding in 146 towns and cities in England.

The work, however, was far from satisfactory. No uniform policy or practice with respect to the character of the meal provided, the charge made to the children, or the method by which certain children were selected for free feeding was followed.

There was, however, almost universal testimony that the effect of such meals, unsatisfactory as they were in many respects, was most marked both in improving the physique of the children and in their school work. At least, a beginning had been made which proved invaluable later when the public demanded a carefully thought out and well-administered system of school feeding. This came early in the present century.

The Boer War did much to bring the issue of malnutrition and school feeding to the forefront. The military authorities found that three out of five who sought to enlist in the army were rejected because of physical disability. This startling fact led to two public inquiries; that of the Royal Commission on Physical Training in Scotland and of the Interdepartmental Committee on Physical Deterioration. Both of these commissions concluded that the apparent deterioration of the race was largely due to malnutrition in childhood. They took the general view that if the nation compels children to attend school, it must also see that they are physically fit to profit by the instruction which is offered them.

The presentation of the reports of these commissions was followed by a series of debates in Parliament as to whether school feeding should be administered by the education authorities or by the poor-law authorities, there being apparently no disagreement as to the need of the service or the utter inability of private societies to perform it. The view that school feeding was essentially an educational matter and not one primarily of relief prevailed. In December, 1906, the education (provision of meals) act was passed by Parliament. Scotland was excluded from the provision of the first act but was taken in two years later. The act was predicated on the theory that no child should be deprived of the full value of his education because of lack of food. All undernourished children were to be provided with a school meal, sold at cost to those who could afford it and given free to those who could not.

FRANCE.

School feeding in France antedates that of England. The origin and genius of the movement in France, however, differs materially from that of England. School feeding in France has been more democratic in spirit and empirical in method than in England.

The work in France, as elsewhere, originated in volunteer effort. Early in the history of the public-school system, school funds, *caisses des écoles*, were formed by the residents of various districts to enable needy children to attend school. These *caisses des écoles* were first supported entirely by voluntary contributions, but later subsidies were made to them from the public treasury. Out of these funds, clothing, food, books, and other necessities were provided for indigent school children. By 1880 the *caisses des écoles* had attained such importance that their establishment was made obligatory in all districts.

Naturally an important function of the *caisses* was the provision of food. When the demand warranted it a school lunch or *cantine scolaire* was established by means of these funds. Gradually *cantines* appeared in various districts in Paris and other towns, until, according to the latest reports, they were in operation in 1,400 communes in France and were providing food for 187,000 children.

As the system developed, a larger proportion of meals was served free. In 1882 only 33 per cent of the meals were served free, but in 1898 the proportion of free meals had increased to 63 per cent. In the latter year the municipal subsidy amounted to 1,017,000 francs. For fear that the expenditures would constantly increase, the council restricted the allowance in the following year to 1,000,000 francs.

OTHER EUROPEAN COUNTRIES.

School feeding as performed in England and France is fairly typical of what is found in Europe. A complete narrative of the history of the work in each particular country would, therefore, be simply redundant. Suffice it to say that in Germany, Austria, Holland, Belgium, Switzerland, Italy, Norway, Sweden, and Denmark school feeding has been performed for a generation either by voluntary societies or by municipalities, while Spain and Russia had before the war made beginnings in the movement.

UNITED STATES.

The first penny lunch was started in Philadelphia in 1898 (3). It took 10 years, however, for the idea to take hold of the minds of public-health authorities and educators. In 1904 and 1905 Hunter and Spargo called attention to the vast amount of underfeeding among school children and pointed to the imperative need of school feeding to cope with the evil. Dr. William H. Maxwell, for many years superintendent of schools in New York City, was an early advocate of the work and repeatedly urged its adoption upon the board of education. His entreaties, however, were not heeded until 1908, when a school lunch was established in two New York schools by the New York school lunch committee.

Opinion in America has from the beginning been adverse to free meals on the ground that such activity tends to pauperize school children and is entirely devoid of any real educational value, but it has rather favored a self-supporting or partially self-supporting lunch for school children. "Penny lunches," as they were called in the early days, were simply intended to make it possible for children to purchase soup, cocoa, and other nourishing foods with the money that they were already spending for trash.

THE PRACTICE OF SCHOOL FEEDING.

EXPERIENCE OF GREAT BRITAIN (*4*).[1]

The provision of meals act went into effect on December 21, 1906, and was followed by an immediate and remarkable increase in the number of meals served. In 1907–8 there were but 2,751,326 meals provided, while in 1914–15 the number reached 29,560,316. During the war the number of meals served fell off until in 1917–18 only 6,503,140 were served.

The average cost per meal was 2.47d. per meal in 1914, but increased to 5.33d. in 1917, owing to the increase in cost of food and labor. The number of children receiving school meals dropped in 1917 to one-seventh the number fed in 1914. In the latter year the number was unusually large owing to the extended strikes among coal miners and a resultant poverty in the miners' homes.

Where meals are served.—The meal has been served in one of four places: (1) In the school itself; (2) in outside restaurants or eating houses; (3) in centers outside of the school building; and (4) in the homes of the children.

The first place, i. e., the school building, has been least often used except in special schools for defective children or in open-air schools. The conditions existing in the British schools made it difficult to secure satisfactory places within the buildings for the meal service.

In practice the second method, i. e., permitting local restaurants to contract to feed the children, has proved most objectionable of all because the places themselves are frequently insanitary and there is always a tendency for the restaurant keeper to profiteer at the expense of the children.

The most popular places for serving meals have been "centers" or canteens located near the schools. These canteens are under the direct control of the authorities, though this has not always assured satisfactory food or conditions.

In one place, the Borough of Leicester, bread and milk are sent to the homes of necessitous children.

Preparation of food.—The food is prepared either by commercial caterers or directly by the canteen committee through its executive staff. The disadvantages of contracting for this service is that the canteen committee has not adequate control of the conditions under which the food is prepared or the dietary standards of the meals. The contract system is used to a large extent in London, and the Alexander Trust, which prepares most of the food served in the London schools, appears to be rendering excellent service. In Bradford all of the food is prepared by the canteen committees for 10,000 children who are served there daily. Not only is the service prompt and efficient, but the quality of the food is excellent.

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[1] Refers to item No. 4 of Bibliography.

In large towns most of the food is prepared in central kitchens, packed in heat-retaining vessels, and carted to the feeding centers in wagons and motor trucks. Only in the small towns or in large towns where the feeding centers are widely scattered is the individual kitchen plan used. The adoption of the central kitchen plan is urged by the authorities wherever practicable because it makes possible not only the centralized supervision of the cookery and the quality of the food, but also results in considerable economy in labor and overhead expenses.

Time of the meal.—Both theory and practice vary as to the time at which the meal is served. Breakfast, dinner, and supper are each regarded by different authorities as the most satisfactory meal, while some, notably London, provide all three. Of course, the noon dinner is the most popular meal and practically all authorities now provide it. Until 1912 Birmingham, however, served breakfast exclusively. In that year, while it served 370,944 breakfasts, it provided 2,739 dinners as an experiment. By 1916–17 the advantages of the noon meal were so clearly demonstrated that the order was reversed, with 31,153 dinners and 13,273 breakfasts. The usual practice now is to regard breakfast as a supplementary meal to be given only to exceedingly necessitous children in addition to the noon meal.

Vacation.—The custom of providing school meals during vacations soon arose and spread rapidly. The Bradford feeding experiment clearly demonstrated that with the discontinuance of the meals during the vacation the children lost the gains they had made during the feeding period. The experience of other committees corroborated this evidence, with the result that many authorities took the liberty of continuing the service through the vacation season. The practice was finally declared illegal, but this impediment was removed by amending the act in 1914. In 1914–15, the first year after the passage of the amendment, of the 133 authorities providing meals, 108, or 81 per cent, provided vacation meals. In 1916–17, however, when suffering was less acute, only 72 per cent of the authorities provided vacation meals.

The dietary aspects of the meal.—Naturally an important phase of school feeding is the planning of the dietaries so as to provide in the school meal for the deficiency in the child's diet at home. This has both a quantitative and a qualitative aspect. Not only must the child be given a sufficient number of grams of food, producing so many calories, but provision must also be made for balancing the diet so as to compensate for the elements usually lacking in the home diet of the underfed child. English authorities are pretty well agreed that the diet of necessitous children is particularly deficient in proteins and fats. Children of poor or ignorant parents are usually amply provided with starchy foods, such as bread and potatoes, and with sugars, usually in the form of treacle.

The school breakfast there usually consists of oatmeal, treacle, bread, milk, and margarine. The articles are provided in sufficient amount to yield 19.9 grams of protein, 20 of fat, and 600 calories in energy value. There is practically no variety in the breakfast menu either in Bradford or other towns, but there is, of course, considerable variation in the dinner menus. About two-thirds of the dinners have meat for the main course, while a third are "vegetable" dinners. A typical dinner consists of cottage pie, green peas, gravy, and stewed fruit. A dinner of this sort yields 33 grams of protein, 21 grams of fat, and 849 calories.

If supper or "tea" is served, it is usually very simple and consists of bread and margarine and tea with milk. Even this scanty meal provides 19 grams of protein, 18 grams of fat, and 433 calories.

Where the school feeding work is carefully coordinated with the school medical service, the menus are usually submitted to the medical officer for approval as to their food value. In London the school medical service recently established a standard dinner which it regarded as essential. This standard called for 25 grams of protein and a total caloric value of 750 units for each child. Everywhere the authorities assume that if the meal furnishes the required number of calories and the proper amount of protein, the other elements, carbohydrates, fats, and mineral salts, are present in sufficient quantities.

The selection of the children.—In the selection of children to be fed, two tests are supplied—the physical and the poverty test. According to the physical test a child is selected for the meals if, in the judgment of the school doctor or nurse, he is undernourished, regardless of the economic condition of his parents. According to the poverty test a child is selected for the meals if the investigation of the home reveals the fact that there is insufficient income in the home to provide adequate nutrition for him. Usually the two tests are combined, but there is a great difference in the emphasis which is placed on one or the other test. The chief medical officer, however, is constantly urging the canteen committees to apply both tests, pointing out that the provision of meals is not meant to be merely a form of relief, but to deal with all cases of malnutrition whatever they may be. If the physical test is not applied, many children whose malnutrition is due to the ignorance or apathy of their parents will not be provided with the proper nutrition. Usually in the smaller towns the physical test is applied more rigorously. In Brighton, Hester, and other small towns approximately 50 per cent of the children fed are selected because of poverty, and 50 per cent are selected because of malnutrition alone.

There is still little provision for insuring the attendance on the meals of those children whose malnutrition is not due to poverty. Some authorities, notably Miss M. E. Bulkley (*4*) and the chief medical officer, think that the only way out of this dilemma is to provide free meals for all undernourished children regardless of their economic status. They believe that in this way not only will the meals be a more effective means of dealing with *all* cases of malnutrition, but that invidious and unpleasant distinctions will be avoided and the service put on a wholesale democratic basis.

The educational aspect.—It is generally recognized in Great Britain that the meals should offer a definite contribution to the child's education. This contribution is to be made not only in providing the child with adequate nutrition to keep him in a physical condition fit to respond to the instruction offered him, but also in imparting to the child the knowledge of the value of wholesome food and of instilling decent habits of eating. In communities where this phase of the work is receiving the most careful attention special teachers and monitors are provided for serving the meal and for keeping order. The tables are spotlessly clean and are frequently provided with tablecloths, flowers, and other amenities. The work is gradually being coordinated with the teaching of domestic science. In some of the smaller schools girls of the cooking classes prepare the lunch for the entire school. The work is carried still further into the homes by inviting the mothers to attend the luncheon with their children, in the hope that proper standards will gradually become a part of the living standards of the family affected by the meals.

EXPERIENCE OF FRANCE IN SCHOOL FEEDING.

Organization.—The administration of school feeding in France is effected through the local school-fund committees (caisses des école). In Paris, for example, there is a school-fund committee for each of the 20 arrondissements. The school-fund committee appoints a canteen committee to supervise the school canteens in its district. Beside the members selected from the larger committee, the canteen committee is made up of from 20 to 25 delegates elected by the voluntary subscribers to the school fund from their own ranks. The canteen committee appoints the manager for each canteen, who is held responsible for the purchase and preparation of the food.

While this decentralized plan results in a certain lack of uniformity in standards and methods, the complete autonomy given to the local committees, on the other hand, stimulates a keen interest in the school meals, which is largely responsible for their success. Committee members visit the various feeding centers regularly to inspect the food and service and to see that proper standards are maintained. In this way the canteens in Paris are prevented from becoming merely perfunctory and official.

Character of the meals.—The meal usually takes the form of a noon dinner (*18*), although in a few instances hot soup is provided at the opening of school for needy children. The school medical inspector is frequently charged with the responsibility of supervising the menus to insure the maintenance of proper food standards. Meat is furnished every day for the older children and twice a week for the younger ones. The quantity of meat given to each child varies, according to age, from 40 to 60 grams. The menu usually provides soup, a meat dish, and a vegetable. Desserts are seldom provided and no drink except water.

Service of the meals.—It is in the matter of service that school feeding in France particularly excels that of all other countries. The meals are conducted in a most dignified and attractive manner. An ample service staff is provided to wait on the children, and teachers are placed in charge to preserve order. Most of the teachers take their meals with their children, and their presence has a wholesome effect on the manners of the children The children are provided with napkins, knives, forks, and spoons, and the tables are kept scrupulously clean. The educational effect, therefore, in raising the general standard of living is significant.

Pay and free meals.—About two-thirds of the children receive this service free. The remaining third pay for the cost of the food, but not for the service or equipment. Despite the fact that so large a proportion of the meals are served free, the "charity" atmosphere so prevalent in the English schools is entirely lacking. This is avoided by an ingenious system of tickets. On entering the room each child passes through a booth where he secures a ticket. Those who can, pay; those who can not are admitted free, but receive a ticket the same as those who pay. The home conditions of the indigent child are then investigated, and if it is found that the parents really can not afford to pay, he is given a ticket each day without further comment. In this way the children are kept in ignorance of those who pay and those who do not.

Financial aspect.—Theoretically the school funds are supported both by private contributions and public subsidy, but as a matter of fact the amount secured by voluntary contribution is almost negligible, less than 2 per cent in most cases. The luncheon sales produce only a slight revenue, since only a third of the children pay for their meals, and since the prices charged simply cover the cost of the food. The city of Paris, before the war, provided annually over $200,000 for the support of school meals. Thus, more than two-thirds of the funds for school meals in Paris are raised through taxation. There is a growing feeling that the collection of the other third through lunch sales and voluntary contributions ought to be entirely abandoned. Many feel that an injustice is wrought in making the one-third pay twice, not only for the food they themselves consume, but for the meals of the others through taxation. It seems probable, therefore, that eventually the whole system of school feeding in France will be free in keeping with the general tendency to socialize all public activities which are concerned with the education of the child.

AMERICA.

No adequate census has ever been taken of the extent of school feeding in America, but a recent survey of the Bureau of Municipal Research (New York) gives a fair idea of the growth of the movement. In February, 1918, the bureau sent a questionnaire, covering the essential points of school feeding practice, to 131 cities of 50,000 population or over; replies were received from 86 of them. The growth of the work in various cities during the past four or five years is clearly shown in the following table:

Growth of school-lunch service in certain cities with 300,000 population and over.

[Prepared by the Bureau of Municipal Research.]

City.	Period.	Growth.
New York City (Manhattan)	1911–1915	Elementary—9 to 49 schools.
New York City (Brooklyn)	1912–1915	Elementary—4 to 16 schools.
Chicago	1912–1916	Elementary—10 to 28 schools. Intermediate. High—0 to 31 schools.
Philadelphia	1913–1917	Elementary—0 to 16 schools.
St. Louis	1913–1916	Elementary—1 to 5 schools.
Boston	1911–1917	High—18 to 18 schools.
Pittsburgh	1914–1917	High—3 to 7 schools.
Los Angeles	1914–1917	Elementary—7 to 10 schools. Intermediate. High—13 to 16 schools.
San Francisco	1912–1916	High—1 to 3 schools.
New Orleans	1911–1916	Elementary—2 to 10 schools High—3 to 3 schools.
Minneapolis	1911–1916	Elementary—2 to 6 schools. High—5 to 6 schools.

Obviously the high-school pupils fare better in the provision of the school lunch than those of the elementary schools, since 66 of the cities, or 76 per cent of those reporting, provided a lunch for high-school pupils, while only 22 cities, or 25 per cent, provided an elementary-school lunch. The reason for this is not far to seek. The lengthening of the daily high-school session and the shortness of the lunch hour, together with the great distance which most of the children are obliged to travel, make some provision for a substantial luncheon in most cities imperative. On the other hand, the children attending the elementary schools usually live within a few blocks of the school and the full hour allowed for luncheon seems sufficient time to permit them to return to their homes for the noon meal. But from the social point of view there is a greater need for lunches for elementary school children. It is during this period of the child's life that inadequate feeding does most harm and it is then that food habits are formed which cling throughout the life of the individual and impair both his physical and mental efficiency.

Moreover, the fact that the high schools have so far received most attention throws light on the attitude of the American public toward school feeding. Most cities regard school lunches merely as a convenient accessory to the school system and not as a means of putting the child in the proper physical condition to profit by the education which is afforded him or of raising the general standard of living. Indeed, of the 72 cities reporting school lunches, only 5 indicated in their reports that the lunch had been established definitely for the purpose of combating malnutrition.

NEW YORK CITY.

Until January, 1920, lunches in the elementary schools of New York City have been provided entirely by the voluntary societies, the New York and

Brooklyn school lunch committees. With the opening of the school year, 1919-20, the board of education assumed full responsibility for school lunches in Manhattan and the Bronx, and during the subsequent school year assumed responsibility for the work in all boroughs.

While the board of education has furnished the necessary space for kitchens and lunch rooms and usually equipped them, it assumed no further responsibility for the conduct or success of the service.

A detailed description of school feeding in every community where it is practiced would lead to unnecessary repetition. We shall, therefore, describe in detail the work in only the most representative community, with particular emphasis on the points on which they differ in practice.

The experience of New York City in school feeding covers a dozen years. The work has been developed under the auspices of two private organizations, the New York and Brooklyn school-lunch committees. In January, 1920, the board of education assumed full responsibility for the work in Manhattan and the Bronx, and in September, 1920, took over the work in Brooklyn as well. It has been the function of the private organizations to demonstrate that school lunches can contribute to the physical and social well-being of the child and to develop methods which could be used by the educational authorities when they were ready to assume what is really their own responsibility.

In private hands, the school-feeding work in New York City grew until in 1917–18 lunches were provided in 58 public schools. In the following year it seemed likely that the city would undertake responsibility for the work, and this consideration, together with the fact that the cost of the service was constantly rising, led the New York school-lunch committee to contract its service to those schools in which the need for the service was most imperative. During that year (1918–19) only 44 schools were served. In September, 1919, the New York school-lunch committee withdrew entirely from the field to facilitate the transfer of the work to the department of education. The inadequacy of the city's appropriation made it possible for the city to serve only 14 schools. The following table indicates the number of schools served with a school lunch in New York City since the beginning of the work:

Manhattan and Bronx.

School year.	Number of schools.	Lunches served.
1912–13	17	222, 235
1913–14	17	431, 375
1914–15	19	467, 983
1915–16	49	800, 000
1916–17	34	825, 000
1917–18	35	800, 000
1918–19	26	595, 000
1919–20	14	300, 000

Brooklyn and Queens.

School year.	Number of schools.
1912–13	2
1913–14	8
1914–15	13
1915–16	20
1916–17	22
1917–18	18
1918–19	18
1919–20	16

The service.—In Manhattan and the Bronx the meals are usually served in the indoor playyard. This is admittedly a makeshift. Folding tables and benches are set up by monitors about 10 minutes before the lunch hour. On entering, the children form a line and pass a certain point where they are given trays and spoons by one of the pupil assistants. They then pass the tables where the food is served, select what they want, and pay the required pennies to the cashier, who stands at the end of the line. After the child has made his selection he takes his place at one of the tables, where he eats his luncheon.

Dietary aspects of the meal.—Inasmuch as attendance at the school lunch is voluntary, a prescribed well-balanced meal for each child, however ideal from the point of view of scientific nutrition, is difficult to enforce. Although the children are permitted to select the different portions of food, every effort is made to encourage them to make wise choices. A trained dietitian plans the menus with a view to providing in each portion the highest food value at the lowest possible cost. Racial and religious tastes and prejudices must also be carefully considered in determining the menus offered. The New York committee provided entirely different menus for schools which were predominately Jewish, Irish, and Italian. In Jewish schools only food which complies with the Jewish religion and tradition was offered; in a similar way racial preferences were observed in Italian schools. In schools attended by both Hebrews and Italians, the problem was met by offering in the menu both Italian and Jewish dishes. The department of education at present makes no special provision for racial or religious preference, but serves the same kind of food at all schools.

The following is a typical menu provided by the board of education at the lunch rooms under its jurisdiction:

Menus for week of April 19–23.

Monday: Cocoa, buttered roll, stewed corn, stewed prunes.

Tuesday: Cream of pea soup, peanut and cottage cheese sandwich, brown Betty with lemon sauce, fruit tapioca (apricots or peaches, syrup served on top).

Wednesday: Vegetable soup, baked beans, vanilla cornstarch with chocolate sauce.

Thursday: Lima bean and tomato soup, buttered roll, cream tapioca, rice pudding.

Friday: Cocoa, salmon sandwiches, sliced fruit, and oatmeal cookies.

The main dishes listed above sell for 3 cents. In addition to these articles the child may purchase a slice of bread for 2 cents, a cup of milk for 3 cents, crackers (one sweet and one unsweetened) for 1 cent, and candy (either chocolate or hard candy) for 1 cent. For 10 cents a child is able to buy a wholesome, substantial lunch consisting of three main dishes and a sweet, either a cracker or candy.

The Brooklyn school-lunch committee provides daily a soup, a baked or stewed dish, and a dessert, either in the form of pudding or fruit. Crackers and candy are also sold for 1 and 2 cents. The following is a list of the main dishes served during the past year:

Three cents each: Soups—Yellow split pea, green split pea, cream barley, barley vegetable, white bean, cream lima, lima and rice, lentils, tomatoes and rice, macaroni and tomato.

Three cents each: Vegetables—Baked beans, baked lima and rice, baked lima and macaroni, baked macaroni and cheese, baked macaroni and tomatoes, carrots and green peas.

Two cents each: Desserts—Rice pudding, chocolate pudding, cornstarch pudding, tapioca pudding, baked yellow meal and raisins.

Two cents each: Fruits—Prunes, apricots, peaches, apple sauce.

Preparation of the food.—In the preparation of the food three plans are followed. In the independent kitchen plan a separate kitchen plant is provided for each school in which a lunch is served. In the group kitchen plan a kitchen is maintained not only for serving the children in that particular school, but in four or five schools in the immediate vicinity. In the central kitchen plan the food is prepared in a large plant and transported to the various associate schools. The central kitchen plan differs from the group kitchen plan in that the kitchen is located outside of the regular school building and serves a larger number of schools. In Brooklyn only the independent kitchen plan is followed.

Both the group kitchen plan and the central kitchen plan involve the problem of transportation. When the group kitchens were first put into operation in New York, the food was transported to the outside centers in pushcarts. With the establishment of the large central kitchen, however, this expedient became obviously inadequate, for it was then necessary to deliver the food in a hot condition to 20 schools within two or three hours. Motor trucks and horse-drawn vehicles, therefore, were installed to transport the food from the large central kitchen to the outside schools.

Is the central kitchen plan economical.—In New York the central kitchen plan was not adopted solely for the purpose of economy. In many schools where a lunch was badly needed it was impossible to prepare the food on the premises, either because there was inadequate space for a kitchen or because the principal objected to cooking in his building. The expedient of preparing the food elsewhere, therefore, was adopted. In order to determine the economy of the centralized plan a study was made of the labor cost of the New York school-lunch committee. The following is the summary of the labor cost under the independent and centralized plan for the years 1917, 1918, and 1919:

A comparison of the weekly pay roll of the New York school-lunch committee for the years 1917, 1918, and 1919.

1917.

Central kitchen.	Number of schools served.	Total weekly pay roll.	Weekly pay roll per school.	Daily pay roll per school.
Public School 95	4	$45.10	$11.27	$2.25
Public School 92	7	77.00	11.00	2.20
Public School 21	5	56.00	11.20	2.24
Public School 94	1	9.00	9.00	1.80
Public School 4, Bronx	1	24.50	24.50	4.90
Public School 90	2	26.50	13.25	2.65
Public School 109	5	66.00	13.20	2.64
Public School 47	3	20.00	6.66	1.33
Public School 48, Bronx	1	38.50	38.50	7.70
Public School 11	5	48.40	9.68	1.93
Total and average	34	403.00	11.85	2.37

1918.

Public School 98E	20	$285.00	$14.25	$2.85
Public School 94	1	15.00	15.00	3.00
Public School 47	3	38.50	12.83	2.56
Public School 4, Bronx	1	32.00	32.00	6.40
Public School 48, Bronx	1	39.00	39.00	7.80
Public School 109	5	69.50	13.90	2.78
Public School 90	2	35.50	17.75	3.55
Total and average	33	515.00	15.61	3.12

A comparison of the weekly pay roll of the New York school-lunch committee for the years 1917, 1918, and 1919—Continued.

1919.

Central kitchen.	Number of schools served.	Total weekly pay roll.	Weekly pay roll per school.	Daily pay roll per school.
Public School 98E	14	$289.00	$20.64	$4.13
Public School 94	1	25.00	25.00	5.00
Public School 47	3	76.00	25.33	5.06
Public School 4, Bronx	1	57.00	57.00	11.40
Public School 48, Bronx	1	68.00	68.00	13.60
Public School 109	4	111.00	27.50	5.50
Public School 90	2	52.00	26.00	5.20
Total and average	26	678.00	26.00	5.20

To the labor cost of the central kitchens must be added the cost of transportation. For the year 1919, the average daily transportation cost per school was $1.75. The average cost of serving the lunches during 1919 was as follows:

Central kitchen.	Number of units.	Average daily cost.
Public School 98E	14	$5.88
Public School 94	1	5.00
Public School 47	3	6.81
Public School 4, Bronx	1	11.40
Public School 48, Bronx	1	13.60
Public School 109	4	7.25
Public School 90	2	6.95

While the labor cost appears to be about twice as great in the two Bronx schools, the patronage in these schools was from two to three times as great as the average for the other schools and required a proportionately larger staff to handle it. The above figures indicate that the per unit labor cost diminishes with the number of units operated. The large kitchen at Public School 98E, an abandoned public-school building, is by no means used to its full capacity. This kitchen can easily supply food for 50 schools. It is likely, therefore, that with the further extension of the service from this center a real saving in labor cost will be realized.

Is the school lunch self-supporting?—School feeding practice in New York has rigidly adhered to the sound principle that the child should pay for the food he eats. In Manhattan the receipts from the lunches have always covered the cost of the raw food and part of the cost of its preparation. In Brooklyn the service has from the beginning been entirely self-supporting. The following is a summary of the receipts and expenditures for the New York school-lunch committee for the last year of its service (1918–19):

Income.		Expenditures.	
Receipts from lunch sales	$34,794	Food	$25,083
Deficit	27,234	Salaries and wages	28,965
		Transportation	7,132
		Miscellaneous	848
Total	62,028	Total	62,028

The operation entailed a net loss of $27,234 when all the items entering into the service are considered. Receipts, however, covered the cost of the food, with a balance of $9,711 to be applied toward service.

The following financial statement for the Brooklyn school lunch committee for the year 1919–20 shows a profit of $1,386.81:

Income.		Expenditure.	
Sale of lunches	$25,505.09	Salaries and wages	$5,[illegible].75
		Food	18,0[illegible].76
		Miscellaneous	248.77
		Total	24,118.28
		Profit	1,386.81
			25,505.09

The financial success of the Brooklyn lunch is due to the low labor cost and to the excellent attendance at all of the lunches; both of which factors are largely due to the industry and efficiency of the school-lunch manager. Great economies in labor are effected by the arrangement of the lunch rooms, which is such that only one person is required to prepare and serve the food and take the pennies from the children. In Manhattan, however, the committee has usually been obliged, because of the lack of suitable space, to set up tables in the playground, an arrangement which necessitates at least two workers in most schools. The Brooklyn committee has been able to secure workers at less than the current rate of wages for such service, while the New York committee has paid the prevailing rate for domestic service. For this reason wages are 40 per cent less in Brooklyn than in Manhattan. The financial success or failure of the two committees in the last analysis is a result of policy pursued by each. The New York committee has deliberately chosen schools for its service in which the need appeared great, regardless of the suitability of the building and regardless of the volume of business to be secured. The Brooklyn committee, on the other hand, set out with the deliberate policy of making the lunches self-supporting and has consistently confined its activities to schools which offered suitable facilities and which could insure a good return.

When the board of education planned to take over the lunches in Manhattan it soon recognized that to make the service entirely self-supporting would necessitate charging prices which would exclude from the service many of the children who needed it most. It therefore determined to cover the cost of food with the receipts from the lunch sales and to appropriate city funds to cover entirely the cost of supervision, labor, and equipment. Such a course is amply justified on the grounds that a lunch service, properly administered, is educational, and that the community and not the school child should bear this expense. At this writing a complete statement of the cost of the service under the department of education is not available. The department, however, selected its workers for the most part from the former staff of the New York school-lunch committee and has compensated them at about their former rate.

Provision for necessitous children.—No systematic provision is made for supplying free meals to needy children. The principle has been that if a child's parents can not supply him with the few pennies needed to purchase an adequate school lunch, the mere doling out of a free school lunch is not an adequate remedy for the condition. School-lunch workers have therefore relied on the existing charitable agencies to take care of such families. One organization supplies more than a hundred children daily with free meals. This organization investigates the homes of children who can not pay for their lunches, and if it finds real need a 5 cent meal ticket is provided for each child every school day. Similar arrangements are made by the Brooklyn committee, through the Brooklyn bureau of charities and other agencies.

Educational aspect.—Under private management it was never possible to make the lunches thoroughly educational, and this fact constituted the strongest argument for placing the full responsibility in the hands of the board of education. The coordination which has now been effected between the department of domestic science and the school-lunch department makes it possible to present to the child, in a practical way, the relation of proper food to health. The menus are planned by the supervisor of cooking classes. The preparation and distribution of the food is directed by the manager of school lunches. The purchase of equipment, food, and supplies is handled by the purchasing agent of the board, the superintendent of supplies. All of these officials are responsible to one of the associate superintendents of schools who coordinates all branches of the work. In many of the schools the mothers are invited to attend the lunches, where one of the domestic science teachers points out to them the value of the particular dishes served and urges them to prepare similar food in the home. In schools in which cooking is taught, the product of the cooking classes is often sold at the lunch counter. This plan enables the girls to cook the quantity required by a family rather than by an individual and is a valuable expedient in enlisting the interest of the children in the school lunch. In talks to the children on the relation of food to hygiene the school-lunch menu for the day is used as the "text." The associate superintendent of schools who is responsible for the school-lunch work is convinced that the lunches will have little permanent value to the community unless they are thoroughly educational and intends that this aspect will be emphasized as the system is developed and extended.

High-school lunches in New York City.—A recent study shows that the school lunch is available for 85 per cent of the high-school pupils of New York City. The service is operated either by a concessionaire or by the general organization of the school. Under the concessionaire system the privilege of serving a lunch in the school building is given to an individual, with no charge for rental or for the initial equipment. Unfortunately, no requirements are made as to the quality of food sold or the prices charged. The system is gradually being discarded and the control of the school lunch placed in the hands of the general organization of the school, made up of teachers and students. The result is that usually better food is served at lower prices and that the profits, if there are any, go to support other student activities rather than to enrich commercial caterers.

Types of administration of high-school lunch service and number of pupils to whom such service is provided.

[Prepared by the Bureau of Municipal Research.]

	Total.	Manhattan.	Bronx.	Brooklyn.	Queens.	Richmond.
General organization	36,693	12,479		21,079	3,135	
Concessionaire	19,265	10,256	7,433		396	1,180
No service	9,348	1,572	712	3,861	3,203	
Total	65,306	24,307	8,145	24,940	6,734	1,180

Character of the meals.—The prices charged and the quality of the food vary considerably in different schools In general, the food served at the lunch room operated by the student organization is better in quality and cheaper than in those operated by a concessionaire. The following is a list of the food served at different schools:

Milk, cocoa, muffins, crackers. Soups: (1) Vegetable, (2) tomato, (3) bean, (4) pea. Meats: (1) Beef, (2) ham, (3) croquettes. Fish: (1) Oysters,

(2) codfish, (3) halibut. Hot dishes: (1) Beans, (2) macaroni, (3) rice, (4) peas, (5) potatoes, (6) corn, (7) tomatoes. Sandwiches: (1) Ham, (2) sardine, (3) roast beef, (4) hamburger. Salads: (1) Fruit, (2) potato, (3) tunafish, (4) shrimp. Desserts: Pudding—(1) Rice, (2) chocolate, (3) cornstarch, (4) bread. Custard—(1) Plain, (2) banana, (3) peach. Pie—(1) Chocolate, (2) apple, (3) peach. Sauces—(1) Apple, (2) apricot. Ice cream. Cooked fruits: (1) Baked apples, (2) escalloped. Cakes: (1) Cookies, (2) loaf, (3) jelly or jam, (4) gingerbread, (5) short cake. Fruits: (1) Apples, (2) bananas, (3) oranges. Candies.

Prices vary so much in different schools and in all schools from year to year that no attempt has been made to cite prices for each article listed above. Soups are usually from 5 to 10 cents; meats, 15 cents or more; and desserts from 5 to 10 cents.

Cost of the meals.—The fact that the concessionaires gladly accept the privilege of operating high-school lunches is in itself ample evidence that the service can at least be self-supporting. Of the high schools reporting to the Bureau of Municipal Research, only one showed a deficit. The following is a financial statement of 10 high-school lunch services. It is interesting to note that in each case the service was operated by the general organization of the school. In such instances the aim is not to make a large profit, as in the case of concessionaires, but to render the very best type of service at the lowest possible cost.

Receipts and expenditures (1916–17) for school-lunch service administration under the general organization of 10 high schools.[1]

[Prepared by the Bureau of Municipal Research.]

High school.	Receipts.	Expenditures.	Deficit or surplus.
Bushwick	[illegible]	[illegible]	[illegible]
Commerce	[illegible]	[illegible]	[illegible]
Commercial	[illegible]	[illegible]	[illegible]
De Witt Clinton	[illegible]	[illegible]	[illegible]
Erasmus Hall	[illegible]	[illegible]	[illegible]
Girls	[illegible]	[illegible]	[illegible]
Julia Richman	[illegible]	[illegible]	[illegible]
Manual Training	[illegible]	[illegible]	[illegible]
Richmond Hill	[illegible]	[illegible]	[illegible]
Bay Ridge	[illegible]	[illegible]	[illegible]

[1] No report from Eastern District, Flushing, Jamaica, Newtown, and New Utrecht.
[2] Deficit.

Educational aspect.—The high-school luncheon ought to be educational in spirit; that is, it ought to instil in the pupils a taste for good and wholesome food and some idea of its economic value. In the Julia Richman High School, particularly, this phase of the work has been well developed. When the luncheon was first undertaken there, a series of food bulletins was prepared and issued daily to the pupils. These bulletins discussed in simple language the fundamental scientific aspects of food and its relation to health of the individual. The school-lunch work in that high school is also coordinated in an interesting way with that of the teaching of domestic science. All of the work of preparing and serving the food, with the exception of the most menial work, is performed by domestic-science pupils.

SCHOOL LUNCHES IN PHILADELPHIA.

Philadelphia has an excellent school-lunch system. For many years school lunches were operated in the elementary schools there by a volunteer organization known as the Home and School League. In 1915 this service was taken over by the board of education and added to the department of high-school lunches, which for several years had served lunches in the high schools. In 1914-15 school lunches were operated in seven schools. The service was extended each year until in 1917 it embraced 25 elementary schools and 16 high schools.

Organization.—The advantage of combining the high and elementary lunch systems is that it enables the director to purchase food and equipment advantageously and to distribute labor and overhead costs economically over the large number of units. At the head of the bureau of school lunches is a director who is responsible for the entire administration and the financial success of the school-lunch system. The city makes no contribution to salaries or office expenses, but has provided much of the initial equipment for the various kitchens and centers. The school-lunch director has been obliged, however, to replace much of the equipment out of the proceeds of the lunches. She is obliged to make the service entirely self-supporting and to pay her own salary and that of her staff from the receipts from the various centers. The service is therefore practically no financial burden to the city. The profits which are made from the service in the high schools are applied to the deficits of the elementary schools.

Lunches in elementary schools—Character of the meal.—Philadelphia has from the beginning served a midmorning lunch to the pupils in the elementary schools. It was found that the morning recess, which begins usually at 10:30 a. m., and lasts a half hour, gives the children an opportunity to purchase inferior foods and candies from neighborhood dealers. Partly for the purpose of counteracting this evil and also to provide a warm, nutritious morning meal for those children who had received either an inadequate breakfast or none at all, the midmorning lunches were established. The following is a list of a few of the dishes offered in the elementary schools: Milk, cocoa, crackers, chocolates, fruits, oatmeal, and jam sandwiches.

Service in the high schools.—The food served in the Philadelphia high schools is of excellent quality and is prepared and served with scrupulous attention to sanitation and cleanliness. The dining rooms are equipped with long stationary tables with swivel seats. The children usually remove the soiled dishes and return them to the lunch counter, a practice which not only results in great saving in the labor costs, but is also an excellent training for the children in cleanliness and order. The service in each high school is under the charge of a trained dietitian, who is, of course, responsible for preparing the menus and supervising the service in general.

Financial aspect.—Except for food, no separate account is kept of the high and elementary lunch systems. It is expected that the elementary school lunches will be operated at a loss, while those of the high school earn a fair profit. The city assumes no financial responsibility for the service other than to equip the lunch rooms. The director of school lunches must, therefore, maintain a self-supporting service. The board of education has not been supplying adequate funds for the replacement of equipment and unless this policy is soon changed the service is seriously threatened. The financial statement for 1919-20 shows $10,467.26 was paid for equipment and repairs. This money was taken out of the profits of the business, with the result that there was actually a deficit of $2,874.22, which was paid out of the bank balance from previous years and from a few small donations. The following statement gives an excellent summary of receipts and expenditures of 1919-20:

Receipts.

From lunches—high schools	$309, 627. 68
From lunches—elementary schools	29, 806. 71
From donations	31. 64
From other sources	293. 40
Total receipts	339, 759. 43
Balance June 1, 1919	6, 604. 94
	346, 364. 37

Expenditures.

Salaries and wages	$86, 892. 62
Food, high schools	217, 185. 10
Food, elementary schools	23, 173. 81
Laundry and petty expenses	1, 985. 00
Equipment, replacements	10, 467. 26
Other expenditures	2, 604. 82
Total expenditures	342, 308. 61
Balance in bank June 1, 1920	4, 055. 76
	346, 364. 37

While it is not possible to determine exactly the deficit in the elementary schools, the above statement indicates that the receipts in such schools more than covered the cost of the food. The total receipts from elementary schools was $29,806.71, while the expenditures for food was $23,173.81, which leaves a balance of $6,722.90 to be applied toward salaries and wages.

CHICAGO.

Chicago has the most intensive school-lunch system in America. Lunches are served in all high schools, in the Chicago normal schools, and in 60 elementary schools. The board of education assumes full responsibility for the work. Most of the high-school children attend the lunch room for part of their meal at least, and in the elementary school approximately 31,000 children are served daily. The work is under the general direction of the director of special schools, who is assisted by a supervisor of penny lunch rooms.

The food is prepared in each school, since the central kitchen plan has never been undertaken because of the cost of transportation. The lunch is served either at the morning recess (10.30 a. m.) or at noon. The variety of the food served is attested by the following menus selected at random from three schools:

ADAMS.

Monday: Cocoa; sandwiches (sausage, jam, peanut butter, butterine). Tuesday: Tomato and spaghetti soup, with meat stock; cocoa; sandwiches. Friday: Cocoa; pea soup; sandwiches.

CLAY.

Monday: Cocoa and cracker; cheese sandwich; apple butter sandwich. Tuesday: Bean soup; hot frankfurter sandwich; peanut-butter sandwich. Wednesday: Corn or rice soup, with cracker; hot beef-loaf sandwich; apple-butter sandwich. Thursday: Spaghetti soup; veal sandwich; apple-butter sandwich. Friday: Stewed prunes, with raisins and apricots; salmon sandwich; apple-butter or peanut-butter sandwich.

FROEBEL.

Monday: Cocoa; jelly sandwich; rice pudding. Tuesday: Lima beans; soup with vegetables; sausage sandwiches; bread pudding. Wednesday: Split pea soup with vegetables; butter sandwich; tapioca pudding. Thursday: Kidney-bean soup; sausage sandwich; spaghetti. Friday: Cocoa; jelly sandwich; graham crackers; chocolate pudding.

DORE.

Monday: Soup, meat stock with rice or barley; meat sandwich, 2 cents; bread and milk (1 slice, one-fourth pint milk), 1 cent; jelly bread. Tuesday: Meat sandwich (sausage), 2 cents; jelly bread; bread and milk; apple sauce (1 portion with bread), 1 cent. Wednesday: Beans; bread and milk; prunes (1 portion with slice of bread), 1 cent; jelly bread. Thursday: Meat sandwich; chocolate pudding (Gumpert's prepared chocolate pudding); bread and milk; jelly bread. Friday: Hot cocoa; bread and milk; jelly bread; pie (lemon cream or fruit).

HAYES.

Monday: Cocoa; cookies; sandwiches (sausage and apple butter). Tuesday: Lima-bean soup; sandwiches; cookies. Wednesday: Macaroni with tomato sauce; stewed prunes; sandwiches; cakes. Thursday: Baked beans; sandwiches. Friday: Cocoa; prunes; cookies; sandwiches.

A better idea of the quality of the food served and its cost can be obtained from a few sample recipes with the caloric value and costs worked out for each. The following are a few typical recipes:

HOLDEN.

Cocoa, 1 pound.
Sugar, 1½ pounds.
Milk (skim), 4 gallons.
Water, 2 gallons.

Cost, $1.35.
Portions, 150.

Calories per portion	68
Bread	63
Total	131

MARSH.

Cocoa, 1½ pounds.
Sugar, 3 pounds.
Milk, three 2-pound cans.
Water, 8 gallons.

Cost, 86 cents.
Portions, 100.

Calories per portion	130
Bread	63
Total	193

HAYES.

Lima beans, 6 pounds.
Snow drift, 1 pound.
Potatoes, 3 pounds.
Flour, 4 pounds.
Onions, 6 pounds.
Celery, 1 stalk.
Water to make 11 gallons.

Cost, $1.56.
Portions, 200.

Calories per portion	99
Bread	63
Total	162

FARREN.

Peas, dried, 12 pounds.
Bacon, 1 pound.
Crackers, 4 pounds.
Water to make 60 quarts.

Cost, $1.92.
Portions, 250.

Calories per portion	119
Bread	63
Total	182

WALSH.

Rolled oats and milk.

Rolled oats, 2 pounds (cooked in fireless cooker over night); served with whole milk and sugar.
Milk (whole), 4 quarts.
Sugar, 1 pound.

Cost, 79 cents.
Portions, 70.
Calories per portion, 95.

BELL.

Creamed potatoes and peas.

Potatoes, 33 pounds.
Peas, three 20-ounce cans.
Milk (skim), 2 quarts.
Flour, 1 pound.
Butterine, ½ pound.

Cost, $1.80.
Portions, 180.
Calories per portion, 100.

HOLDEN.

Baked beans.

Navy beans, 15 pounds.
Syrup, 1½ pints.
Salt pork, 12 ounces.

Cost, $1.94.
Portions, 360.
Calories per portion, 142.

FROEBEL.

Bread pudding.

Bread, 4½ pounds.
Sugar, ¾ pound.
Milk (skim), 1 quart.
Raisins, ½ box.
Eggs, 3.
Vanilla, 2 teaspoonfuls.

Cost, 62 cents.
Portions, 65.
Calories per portion, 116.

BELL.

Ginger bread.

Flour, 4 pounds.
Butterine, ¾ pound.
Sugar, 2 pounds.
Molasses, 4 cups.
Soda, 4 teaspoonfuls.
Cinnamon, 4 teaspoonfuls.
Ginger, 2 teaspoonfuls.
Eggs, 3.
Salt, 1 teaspoonful.

Cost, $1.25.
Portions, 125.
Calories per portion, 121.

It will be noted that the caloric value is a little low for each portion of food. A child selecting a soup with bread and a dessert would receive from 250 to 300 calories, whereas in the New York and Brooklyn lunches he would secure about 350 to 450 calories. This difficulty could easily be overcome by increasing both the price and the size of the portion. Most of the soups cost less than 1 cent a portion; by doubling the portion a more adequate lunch could be provided and at a price which all could pay. By increasing the amount of milk used in the cocoa a much more nourishing portion could be served at a slightly increased cost.

Cost of the service.—The supervisor of penny lunch rooms does not keep a detailed account of expenditures. The board of education pays for the entire cost of labor and equipment. This for the year 1919-20 amounted to about $70,000. The service in the high schools is entirely self-supporting.

BOSTON.

For many years no provision was made for lunches in the elementary schools in Boston. During the war, however, school feeding was undertaken by a voluntary committee as part of the food-conservation work and is still continued. This committee secured from several large butchers the brisket bone and other portions of the beef carcass which prior to that time had not been used for human food but sold for fertilizers and other purposes. By adding a few vegetables this material is used in making a beef soup, which is sold at several of the Boston schools for 1 cent. Bread, cocoa, and other foods are also sold at cost price. A large part of the work is performed by volunteers to keep down expenses and thus to aid in extending the service. It is hoped that this effort will be an entering wedge toward securing an adequate school lunch for the children in the elementary schools of Boston.

The high-school lunches in Boston compare favorably with those of any city in the country. The lunches are administered by a private society known as the Women's Educational and Industrial Union. The food is prepared in a large central kitchen plant under ideal conditions and transported to the various schools, where it is served. Provision is made in most of the schools, however, for rewarming the food after it reaches the school. An excellent system of accounting has been installed and the working staff is well organized. The following is a list of the various portions offered for sale:

Soup: Cream of cabbage, beef and rice, vegetable mulligatawny, split pea, lima bean. Sandwiches: Egg sandwich, fruit butter, chopped ham, cheese and pimento, minced tongue, raisin and nut, sardine sandwich, Creole, sliced ham, olive salad. Bread specials: Bran muffins, corn muffins. Hot specials: Creamed carrots and peas, baked beans, vegetable salad, American chop suey, fish hash, samp with tomato and cheese. Dessert or salad: Chocolate bread pudding, wh. cr.; blanc mange, strawberry sauce; apple tapioca, wh. cr.; spiced prune, wh. cr.; coffee jelly, wh. cr. Cake or pie: Fig cream pie, liberty cake, chocolate cream pie, sponge cake. Ice cream: Macaroon, pistachio, pineapple, raspberry, maplenut.

Articles always provided are lettuce and bread and butter, sandwiches, milk, cocoa, custards, plain cake, fruit, and sweet chocolate, apples, bananas, peanut butter and jam in rye rolls.

The high-school service for many years was entirely self-supporting, but since 1917 a slight deficit of from $1,000 to $2,000 annually has been incurred.

ST. LOUIS.

In 1911, the board of education of St. Louis undertook to conduct a lunch service in its schools. It was decided, however, that it was illegal to spend public funds for the purchase of food and the board was obliged to abandon the work. The Penny Lunch Association, a voluntary society, then assumed full responsibility for the service even to equipping the lunch rooms. During the school year 1918–19 lunches were conducted in seven elementary schools. Most of the service except the actual cooking of food is performed by volunteers. The service in the high schools is under the direction of the education authorities and is more than self-sustaining. Lunch is served in six high schools and a normal school. For the school year 1918–19 the board of education reported a profit of $141.70.

LOS ANGELES.

The board of education of Los Angeles has charge of lunch rooms in 9 high schools, 8 intermediate schools and 31 elementary schools. It is estimated that from 450 to 1,800 pupils attend the lunches daily in each of the high schools, from 700 to 1,000 in each of the intermediate schools, and about 120 in each of the elementary schools.

The supervisor of the home economics department directs the lunch work in all schools. In the elementary schools the lunches are managed by the cooking teacher. In the high and intermediate schools the lunches are managed either by the student body association or by a cafeteria director from the home economics department. When the lunch is managed by the student body association one of the teachers, not necessarily a teacher of home economics, supervises the work.

The elementary schools selected for the service are those in which the amount of defective nutrition is greatest. The principals and teachers in these schools see that the undernourished children are fed at noon. In urgent cases a lunch of bread or crackers and milk is served at 10 o'clock in addition to the noon meal. The food is usually sold at about cost price, but when the child is unable to pay it is sold below cost or supplied free. The deficit is made up by the Parent-Teacher Association or other philanthropic societies. Children who are supplied with free meals are given work in the home economics department or elsewhere to make them feel that they are not objects of charity.

Cost of the service.—The service in the high and intermediate schools is entirely self-supporting, largely because of the economies effected through cooperative buying on the part of teachers and pupils and because of the service given by the pupils for which food is the only compensation received. The receipts in the elementary schools for 1919–20 were $42,000; the cost of food was "approximately" $30,100.07. There is no complete record of other expenses, but the supervisor states that there "was no surplus."

LOUISVILLE, KY.

Louisville was the first city of the South to establish a school lunch under the management of the school authorities. In 1913, school lunches were begun as a volunteer service. The success of the undertaking encouraged the board of education to equip successively five lunch rooms. In 1916, the board of education assumed full responsibility for the work and established a department of school lunches to administer the service. Since this department has no revenue except the daily receipts from the lunch room, the service must be self-supporting.

The lunch is served in the middle of the forenoon "to supplement an insufficient or faulty breakfast or a breakfast hastily eaten." The menus, which are uniform for all schools, include milk or cocoa, soups, creamed vegetables, sandwiches, fruits, small cakes, and milk chocolate. These articles sell at 2 cents a portion. At the vocational schools, where the luncheon is planned to take the place of the home dinner, the food sells for from 3 to 5 cents a portion.

In the most successful lunch rooms the meal is made a social hour. Each class has its own table, at which the teacher presides as hostess. A spirit of companionship and mutual respect is cultivated which has a most wholesome effect on both teacher and pupil.

OTHER CITIES.

Besides the work in the cities mentioned, school feeding is carried on in Pittsburgh; Cleveland; Cincinnati; Rochester, N. Y.; Houston, Tex.; Mobile; Minneapolis; Indianapolis; Milwaukee; Springfield, Mass.; and many other cities. Since it is obviously impracticable to give a detailed account of the work in each of these cities, important as it is in many cases, the description has been confined to those cities which have developed the work most extensively and is sufficiently varied to cover every type of service now being carried.

RURAL-SCHOOL LUNCH.

It is only recently that the need for a school lunch in rural communities has become apparent. Country children often travel long distances to school and are obliged to carry their lunches with them. Instead of milk, vegetables, and fresh eggs, the lunch of the country child of to-day often consists of soggy pancakes, canned foods, and indigestible pies and cakes. The purpose of the rural-school lunch is to encourage the children to bring wholesome foods with them and to prepare hot nourishing dishes from them during the noon hour. The country-school lunch properly conducted thus fills a real educational need. The school lunch is often used as the sole means, and a most practical one, of giving the children a much needed training in home economics. The children are taught not only how to prepare food properly and given some appreciation of the relative value of foods, but also in setting the table and in observing table manners and other social amenities.

The expense of the rural-school lunch is very slight. A storeroom, which is usually already in the schoolhouse, a few cooking utensils, and a store closet are sufficient to equip a school lunch. These are either supplied by the parents of the children or out of the school funds. The children either bring their food with them or pay for the cost of the food, which is purchased at reasonable prices in the neighborhood.

In many States the work is promoted by the extension division of the school of agriculture. Minnesota, Kansas, and Nebraska provide extension courses for training teachers for this work and supply pamphlets and circulars which give practical instruction in providing a school lunch.

SPECIAL FEEDING.

Besides the regular school lunch, special feeding is frequently provided for anemic, tubercular, and badly undernourished children, usually in open-air classes. In England and Germany such children receive their full nutrition at the open-air schools. In America, as a rule, the food supplied is intended only to supplement that which the child receives at home (*15*).

ROCHESTER, N. Y.

In Rochester children of the open-air classes receive their full quota of nutrition in the school. The meals are planned with scientific care in order to insure that the child shall receive the full ration required by him for recovery and growth. The following schedule of the meals supplied in the Rochester classes illustrates how thoroughly the work is done:

MENU.

Breakfast—Oatmeal with sugar and cream; a glass of milk.

Lunch at 11 o'clock—A glass of milk.

Dinner—Pot roast of beef; mashed potatoes; corn; bread and butter; milk; baked apples with cream.

Afternoon lunch—Cocoa and bread.

Food value of the Rochester daily menu.

BREAKFAST.

Food material.	Amount.	Grams of—			Cost (as of 1916).
		Protein.	Fat.	Carbohydrate.	
Oatmeal, pound	1	113.5	49.6	450.3	$0.075
Milk (whole), quarts	6	180.0	217.2	271.2	.360
Sugar, pound	1			453.6	.070
Total for 30 children		293.5	266.8	1,175.1	.505
Per capita		9.7	8.8	39.1	.017

11 O'CLOCK LUNCH.

Food material.	Amount.	Protein.	Fat.	Carbohydrate.	Cost (as of 1916).
Milk for 30 children, quarts	5	150.0	181.0	226.0	$0.300
Per capita		5.0	6.0	7.5	.010

DINNER.

Food material.	Amount.	Protein.	Fat.	Carbohydrate.	Cost (as of 1916).
Potatoes (1 peck), pounds	15	121.5	6.0	999.0	$0.325
Beef (rump roast), pounds	7	437.5	641.2		1.120
Corn (canned), cans	3	38.1	16.2	258.3	.300
Apples, peck	1	86.4	120.0	3,597.6	.400
Brown sugar, pound	1			430.0	.066
Milk (whole), quarts	8	240.0	289.6	361.6	.480
Butter, pound	¾	3.4	289.1		.300
Bread, loaves	4	166.8	21.6	963.2	.200
Total for 33 individuals		1,093.7	1,383.7	6,609.7	3.191
Per capita		33.1	41.9	200.3	.093

AFTERNOON LUNCH.

Food material.	Amount.	Protein.	Fat.	Carbohydrate.	Cost (as of 1916).
Milk (whole), quarts	5	180.0	181.0	226.0	$0.300
Cocoa, can	1	26.6	32.5	42.5	.115
Sugar, pound	½			226.8	.035
Bread, loaves	2	82.1	10.8	481.6	.100
Total for 30 children		287.7	224.3	956.9	.550
Per capita		8.6	7.4	31.9	.018

TOTAL FOR THE DAY.

Food material.	Amount.	Protein.	Fat.	Carbohydrate.	Cost (as of 1916).
Per capita		56.4	64.1	278.8	$0.14

It is interesting to compare the total quantity of food provided for each child daily in the Rochester schools with that which is usually deemed essential for the average school child. The following table gives the combined estimate of 15 food experts of the daily food requirement of a child of 10 years of age and average weight and that furnished in the open-air classes:

	Estimated daily requirement.	Amount furnished in open-air classes.
	Grams.	*Grams.*
Protein	60	56.4
Fat	40	64.1
Carbohydrates	250	298.8

The Rochester menus provide food in excess of the estimated requirement. The average number of children attending open-air classes in Rochester is only 30. One can readily understand that it would be possible to prepare such an elaborate and costly meal for so few children, while to provide such nutrition for hundreds or thousands of children would involve considerable expense and serious problems of policy and administration.

The food for the open-air classes in Rochester is prepared for the most part by the girls of the cooking class under the direction of the domestic science teacher. The advantages of this arrangement are that it offers a splendid opportunity for the children to receive a concrete lesson in providing a well-balanced daily menu for a comparatively small group of children and that they are able to effect considerable economies in labor.

CHICAGO.

The meals provided in Chicago open-air classes are nearly as liberal as those of Rochester. Mr. Sherman Kingsley states that the average daily cost per child for the food in such cases is 11 or 12 cents. The average daily food value is between 1,100 and 1,200 calories. The following typical menus offered for open-air classes in Chicago show that the children would require very little additional food at home:

Morning lunch—Cocoa, bread, jelly. Noon dinner—Browned beef stew, boiled potatoes, mashed turnips, bread, milk, farina pudding.

Morning lunch—Cocoa, bread, jelly. Noon dinner—Browned beef stew, boiled potatoes, potatoes, chocolate pudding.

In the Chicago open-air classes nearly 500 children were provided for. A great deal of attention is given to the educational aspect of the meal in instilling a taste for good food in the children and in urging the parents to provide better food for them at home.

NEW YORK CITY.

Special feeding is provided not only for the children of open-air classes in New York City, but also for crippled children and those suffering from cardiac effects. The type of food offered in each case is practically the same. It consists usually of a light lunch of milk and crackers or cereal and milk at either 10 o'clock in the morning or 2.30 o'clock in the afternoon, or at both times. A hearty noon lunch is provided for a few of the children of the open-air classes by the Brooklyn school-lunch committee and paid for by a philanthropic society. In some cases, the children pay 2 cents a day for the milk and crackers or cereal and crackers, which payment covers the cost of the food. In other instances, however, the food is provided without any cost to the children. Where a regular school-lunch service is provided, the children are naturally urged to attend. There is no way of telling what proportion of the child's nutrition is thus provided. The following is a schedule of the daily routine of open-air classes in New York City, which will give the reader some idea of the way that the feeding is worked in with other activities of the day (*19*): 9 to 10 a. m., school work; 10 to 10.15 a. m., extra feeding; 10.15 to 11 a. m., school work; 11 to 12 noon, rest period; 12 to 1 p. m., lunch period; 1 to 2.45 p. m., school work; 2.45 to 3 p. m., second extra feeding.

Where cereals or hot dishes are provided for the children, a simple kitchen equipment is usually installed, consisting of a small gas stove and a fireless cooker. The food is usually prepared by the teacher, while the children help in the service. The problem of service is very simple. The classes are limited to 25 children. Fireless cookers are frequently made by the children in school shops or are presented to the school by friends who are interested in the classes.

LOUISVILLE, KY.

The department of school lunches of the board of education provides a light luncheon in the morning and afternoon and a full lunch at noon for the children in the open-air classes. A trained nurse visits the homes of the children and endeavors to interest the parents in preparing suitable food at home. It is impressed upon the parents that the food which the children receive at school is intended to supplement their regular daily ration and that the work can have no permanent effect without the mothers' cooperation.

ST. LOUIS.

The board of education of St. Louis provides a luncheon service in three open-air schools. One of these schools is a resident school, where 16 children are kept under medical supervision and given their full requirement of food until recovery. At the other schools the children receive a midmorning lunch and a "snack" before going home in the afternoon. Soup, cereal, and milk figure largely in the menus of these lunches. The children receive on the average 1,025 calories a day, at an average cost of 17 cents. The receipts from the children do not cover the cost of the food. The cost of the food in 1919 in the two larger schools was $5,849.98; the receipts from the children were $1,143.47. The deficit was paid entirely by the St. Louis Tuberculosis Society. The resident open-air school is maintained jointly by the board of education and the St. Louis Tuberculosis Association, the latter providing for the feeding of the children.

SCHOOL FEEDING AS A REMEDY FOR DEFECTIVE NUTRITION.

In England, as we have seen, school feeding is practically restricted to undernourished children, and particularly to those whose defective nutrition is due to poverty. The theory is that inadequate food is the primary cause of defective nutrition and that, conversely, an abundance of food is the remedy. School breakfasts and dinners are intended to supply what is lacking in the child's diet, and thus to restore him to normal health. The shortsightedness of this policy is now clear to school medical officers and others who are attempting to secure permanent results through school feeding. The application of the physical rather than the poverty test for selecting the children to be fed, the combination of school feeding with other branches of the school medical service, the development of the educational aspect of the service so that the child's, and through him, the parent's food habits will be permanently improved are suggested reforms which many progressive communities are already adopting.

The aim of the school lunch in America, however, has simply been to provide a warm, nourishing noon meal for children who would not otherwise receive one. No attempt has usually been made to select undernourished children further than to select for the service schools in congested neighborhoods where the amount of defective nutrition is likely to be greatest. Undernourished children are often provided for, as we have seen, through special feeding which is intended to supplement what the child receives at home or at the regular school lunch.

America has thus escaped the fatal error of regarding the mere provision of food as the sole remedy for defective nutrition. Fortunately, it is a simple matter to coordinate the school lunch or supplementary feeding with other methods of dealing with defective nutrition which are now being developed.

OTHER METHODS OF ATTACKING DEFECTIVE NUTRITION.

THE NUTRITION CLASS.

The nutrition clinics and the classes connected with them were originated by Dr. William R. P. Emerson, of Boston. In the fall of 1908 Dr. Emerson discovered in his hospital and clinic work a large number of "delicate" children of all social classes who failed to respond to most methods of treatment. At that time he made a study of four or five thousand children who were coming to the children's department of the Boston Dispensary. From this group he selected 15 out of the weakest and most poorly nourished group and organized them into a nutrition class, the object being, as he states, "to study every possible detail of their lives, with a hope that such study will explain their condition and that directions of hygiene and diet could be given to the group in much less time and much more effectively than to each one individually." Each child was provided with a small record book and required to state exactly everything he ate during the 48 hours following his initiation into the class and to give "the number of hours spent in sleep, time out of doors, the number of minutes at meals, and such other details as seemed necessary in each particular case." In addition to this record, a record was secured by a social worker who visited the homes of the children and reported on their housing conditions and the standards of hygiene maintained in the home.

In the nutrition class the children assemble in rows before charts labeled with their names, on which are indicated a curve showing the expected gain of the child and a curve showing his actual progress in weight since admission to the class. The display of the charts, which clearly indicates those who are gaining and those who are losing, furnishes an incentive for each child to outdo the other in carrying out faithfully the suggestions made to him for bringing his weight up to the normal expected for his age. The parents of the children are asked to attend the class and to see for themselves the progress which their own children and others are making.

If a child fails to make his expected gain during the week, the nutrition worker questions the child or looks up his record to ascertain the cause. It may be due to his not having taken a sufficient number of calories of food daily, to his failure to have his tonsils removed, to a bad cold, to fast eating or some other infraction of the health rules. The necessity for carrying out the suggestions of the physician or nutrition worker is thus driven home, with the result that at the next session the child has probably carried out his instructions and shows a gratifying gain.

The nutrition class method with various modifications and further development has been widely copied throughout the country by workers who are aroused as to the seriousness of defective nutrition. Nutrition classes are multiplying so rapidly that a brief description of the modifications to the original plan which have been worked out in representative communities must suffice.

NEW YORK CITY.

The New York Association for Improving the Condition of the Poor has found that nutrition work accomplishes most lasting results when it is coordinated with all other agencies dealing with the health of the child (5). The nutrition work of this association is an integral part of a larger, preventive health program which it is carrying out on an intensive basis in a congested district of 32,000 population. The essential steps in this are prenatal instruction for all expectant mothers in the district, suitable arrangements for the birth of the child, postnatal instruction for the mother, the periodical weighing and complete physical examination of all the children, and immediate attention to the removal of all the defects which the doctor discovers. To do this, in addition to existing facilities, the association employs 15 nurses, 5 dietitians, 1 physician to examine the children and another to examine the pregnant mothers, 3 dentists, and 3 dental hygienists.

Not the least important feature of the examination clinic is that of a feeder for the nutrition workers. It is here that defective nutrition is discovered in its earliest stages before its effects have become permanently fixed and before the habits leading to the condition are firmly established. All cases of defective nutrition discovered by the doctor are at once referred to the nutrition worker for correction.

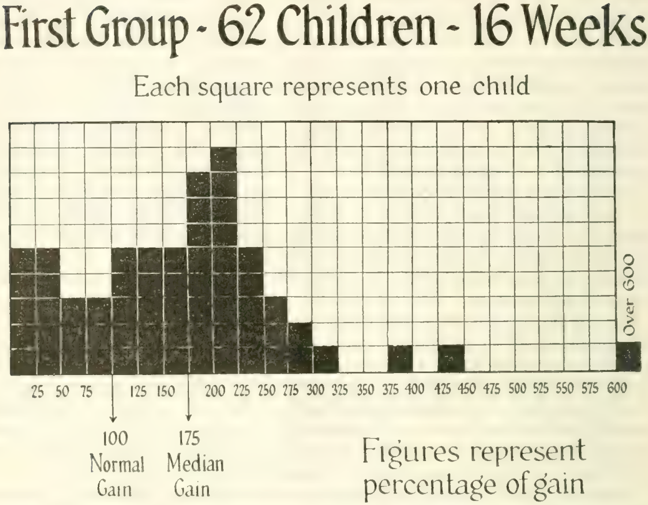
The children of school age are organized into nutrition classes which meet in the public schools of the neighborhood. The work in the nutrition class is accompanied by visits of the dietitian to the home to give practical instruction to the mother in the preparation of the right kinds of food and in demonstrating to her the benefits of conforming with the suggestions made by the nutrition worker. At first the visits are made once a week, but later every two weeks. One dietitian can take care of 50 children, weighing them weekly, meeting with them once a week in the nutrition class and visiting the homes.

With the children of preschool age the class method is obviously impracticable and the work must be accomplished entirely through work with the mother in the home. Since it is impossible for most of the mothers to bring their little tots to the clinic every week to be weighed and to receive the necessary instruction, the nutrition workers go to them. A portable scale capable of weighing up to 120 pounds has been secured which the nutrition worker can take with her on her weekly visits to the home. The child is weighed in the presence of the mother. A failure to gain gives the worker an effective opening in persuading the mother to carry out the instructions faithfully. For the most part, children with whom the association undertakes to do intensive work are continued for a period of 16 weeks and longer if conditions warrant and if the physician decides it will be helpful. Children are dropped from intensive work when a satisfactory gain has been made for a period of 16 weeks or longer and when the improvement in food and health habits and in the correction of physical defects has been sufficient to require constant supervision. But the child is still kept under observation. The home is revisited about once a month and the child reweighed, and if the child has lost in weight and fallen back into his old habits intensive work is again resumed.

Results.—The record of the gains of three groups of children who received intensive work for 16 weeks is now available. While the period covered is too short and the number of children included too small to speak of with any finality, the results are most encouraging. The first two groups were children of school age, the third of preschool age.

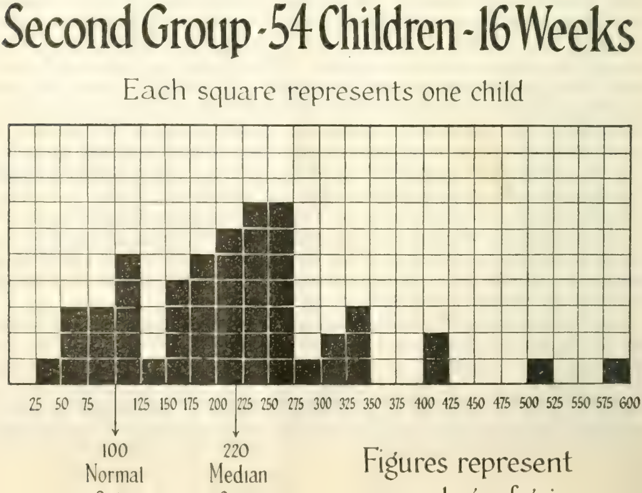
In the first group of 62 children none of the children lost weight, 24 per cent gained but failed to make the normal gain, while 76 per cent gained in excess of normal. The accompanying chart (page 32) indicates that the median gain fell at about 175 per cent of the normal. In other words, the median gain was about 75 per cent in excess of the normal. Moreover, the largest number of children gained from 200 to 225 per cent of the normal, while a few made more than four times the normal gain.

CHART 1.



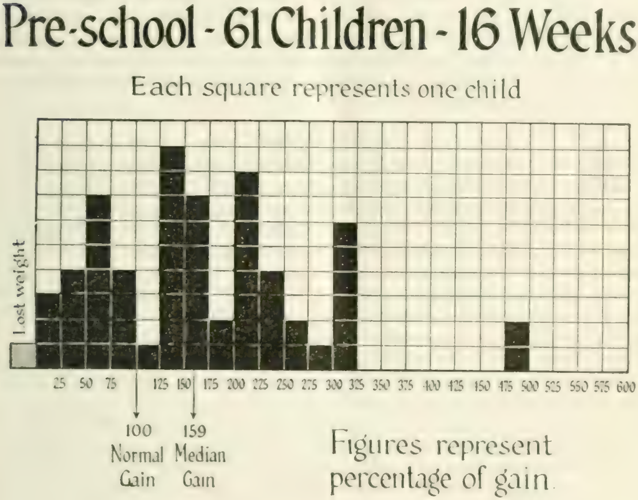
The second group, which was carried at a later period when methods had been more fully developed, made an even better showing. Of this group, consisting of 54 children, none lost weight, 13 per cent gained less than normal, while 87 per cent gained in excess of normal. The median gain for the group fell at 220 per cent of normal, with the greater number falling between the 225 and 275 percentile groups.

CHART 2.



The third group, of 61 children of preschool age, failed to make as good a showing as the other groups because of the difficulties of working with children of this age. The results, however, are far from discouraging. One child lost weight, while 31.1 per cent gained less than normal and 67.2 per cent gained in excess of normal. The median for this group fell at the 159 percentile group.

CHART 3.



NUTRITIONAL EDUCATION IN CLINICS FOR CHILDREN.

With the close medical supervision which is possible in children's clinics excellent opportunity is offered for the clearing up of minor physical defects which retard the child's nutrition. When this is done the balance of the work consists in educational supervision to establish proper food and health habits on the part of both children and parents. The following clinics, all connected with large hospitals, provide such care for their children: Bellevue, Post Graduate, Nursery and Child's, and Mount Sinai. The work is either carried on by personal interview with the child on the part of the physician in charge or through nutrition classes and home visiting. For this purpose Bellevue has a staff consisting of a physician who supervises the work and meets the groups of children, a nurse who assists the doctor at the clinic and who visits the homes, and three volunteers who help take histories and relieve the physician and nurse of many details. At Mount Sinai hospital the physician in charge interviews each child personally.

TEACHERS COLLEGE—COLUMBIA UNIVERSITY.

With the further development of nutrition classes and other methods of dealing intensively with defective nutrition there is a growing demand for especially trained workers in this field. Teachers College of Columbia University is anticipating this demand by giving its students in home economics field training in the work of nutrition classes and in home visiting. Dr. Mary Swartz Rose, of the school of household arts of the college, with Miss Emma

Winslow, secretary of the home economics committee of the Charity Organization Society, are in charge of this work. Nutrition classes are conducted in a room in a neighborhood near the college. The students are required to take their turn at conducting the nutrition class and in visiting the homes.

THE BUREAU OF EDUCATIONAL EXPERIMENTS.

For three years this bureau has been conducting nutrition work in one of the public schools and during the last year it began the work in an experimental play school which it operates (*21, 22*). Dr. William R. P. Emerson organized the nutrition work and supervised it for the first years. In addition to nutrition class work supplementary feeding is provided and attention given to the removal of physical defects.

KANSAS CITY, MO.

During the past school year a most interesting demonstration was made of an intensive crusade against malnutrition in one of the schools of Kansas City. A group of 112 children was selected for the work, ranging from the kindergarten to the sixth grade. The service consisted of a complete physical examination to determine remediable defects, constant medical supervision during the entire period of the experiment, home visits to secure the cooperation of the parents in curing physical defects and correcting incorrect food and health habits, and biweekly instruction classes and weighings. Supplementary feeding was provided in the middle of the forenoon and afternoon. A total of from 1,000 to 1,200 calories were supplied in these meals and they were so planned as to give particular emphasis to the so-called "protective" foods—milk, eggs, and "leafy" vegetables.

At the end of the period the group showed a gain of 231 per cent of the normal gain. A central group of 109 children, who were similar to those included in the experiment, but who did not receive the service, lost an average of 4 ounces apiece. Fifteen children failed to make the expected gain. It was found that in the case of 14 of these the failure to gain was due either to uncorrected physical defects or illness or lack of cooperation in the home. The other child remained thin, but was apparently in the best of health.

THE RÔLE OF SCHOOL FEEDING IN THE MALNUTRITION PROGRAM.

It is obvious that much is accomplished in dealing with undernourished children through school medical and nursing service, the nutrition class, and through personal contact with families. The value of such services has been so well established that the rôle often ascribed to the school lunch will have to be greatly modified. Far from being a panacea for malnutrition, the school lunch has now to be regarded merely as an accessory to a larger social machinery which is better adapted for coping with the various complexities of the malnutrition problem.

But the day is still far distant when cities shall have so perfected their medical, clinical, and other services as to reach every undernourished child. It is conservatively estimated that there are between two and three hundred thousand undernourished children in New York City. When it is considered that the average nutrition class can only care for 50 or 60 children at a time, it can easily be seen that a tremendous expansion is necessary in medical inspection and clinical facilities, and that a considerable readjustment must be made in school schedules before this vast number can be adequately cared for. We shall still have to rely on the school lunch as our best agency for preventing malnutrition by offering a wholesome school lunch to all children who will avail themselves of it.

WHAT TYPE OF SCHOOL FEEDING IS MOST EFFECTIVE?

There are, as we have seen, various theories as to the portion of the child's nutrition which the school meal should provide. In England, where school feeding is still regarded as practically the only antidote for malnutrition, the undernourished child receives the major part of his nutrition from the school meal, while in America he receives from a fourth to a third of his daily ration in the school lunch. It is clear that we ought not to make the mistake of assuming that the child should receive the greater amount of his nutrition in the school. The emphasis should be placed on checking up home conditions so that the family's food standards will be brought up to normal and educating the child to like and to demand adequate and nourishing food. The quantity provided in the school lunch will, therefore, be a compromise between furnishing a hearty meal and a mere snack to assuage temporarily the pangs of hunger.

The question as to when the meals should be served is still an open one. The theory of the midmorning lunch is that the child who receives an inadequate breakfast or none at all must have a light lunch in the middle of the morning to sustain him through the morning school period. Besides, many contend that by supplying a light lunch at this time the undernourished child can increase the total amount of food taken daily without overtaxing his digestive organs. At best, the midmorning meal, however, is a supplementary meal, to be supplied to children whose undernourishment is critical.

It will doubtless be found best to serve a rather ample lunch at noon if only one meal is to be provided. There is a growing feeling that the noon meal should provide a perfect "balanced" ration; that is, it should contain the proper proportion of the various essentials of the child's diet—protein, carbohydrate, fat, and mineral salts. But if the noon meal is to be perfectly "balanced" and to contain a half or a third of the child's daily ration, as many contend, a radical departure from present methods and traditions is essential. The American school lunch has been built up on the theory that the child is to select his luncheon from various portions of food offered for sale. There is, of course, no assurance that the child will select a perfectly "balanced" meal. We have seen that the "balanced" meal can easily be supplied in cases of special feeding where provision is made for supplying an ideal lunch to small groups without cost. If the prescribed luncheon is to be established, the voluntary pay-as-you-go policy must be superseded. To install such a system will involve serious financial considerations, for patronage will undoubtedly fall off when children find that they are required to take a certain meal or none at all. This, however, may be offset by the advantage which would be gained through scientific feeding of at first a limited group, which would be extended later as the advantages of such a meal were impressed on the children.

But even with an à la carte service it is possible to guide the children to some extent in the selection of a properly "balanced" meal. In some cities a child may not purchase a cracker or candy until he has first selected soup, cocoa, or some other substantial dish. Moreover, if care is used in the selection of recipes each portion can provide a fairly well "balanced" ration, particularly if milk is freely used.

"*Protective*" *foods.*—The work of McCallum, Osborne, Mendel, and others has demonstrated the importance of milk, eggs, and leafy vegetables because of growth-promoting qualities which they possess and which many other foods rich in carbohydrates, proteins, fat, and mineral salts entirely lack. The school lunch should therefore provide as much of these foods as is practicable. Supplementary feeding which is intended to build up anemic and undernourished children should be made up almost entirely of this kind of food. For this reason the custom of serving milk and crackers or cereal and milk is most commendable. The best results, however, will come not from the merely temporary provision of such food but in getting the children in the habit of taking it regularly at home.

THE EDUCATIONAL ASPECT.

It is constantly claimed that an important function of the school lunch is to educate the child not only in proper food habits, but also to instill in him a consideration of the interests of his fellows. Here is a fertile field for development in school-feeding work, for little has been done to make the meals really educational, the reason probably being, as we have already indicated, because much of the work up to the present time has been done by private societies which had not facilities for developing this aspect of the work. Experience has shown, however, that children in groups can be taught to eat foods which are good for them and to which they have been unaccustomed at home. The teaching in this instance is not accomplished so much through formal instruction and discipline as through the quiet suggestion of a wholesome meal attractively served.

There remains much to be done, however, in coordinating the school lunch with other departments of the public school, particularly the home economics department, in teaching food values. Not only ought the children to be taught in the classroom the value of the different kinds of foods, but the school lunch ought to serve as a concrete example of the best type of feeding. It might be well in such cases for the teacher to use the menu of the school lunch for that week as a basis for pointing out the value of different types of food in order to enlist the interest of the child in the subject. It is not, however, until the school lunches are operated as an integral part of the educational system and the cooperation of the whole teaching staff of the school enlisted that they can be made really educational.

TO WHAT EXTENT OUGHT THE LUNCH SERVICE BE SELF-SUPPORTING?

The best results can be secured if the receipts from the lunch service are applied only to the cost of the food. The child ought at least to pay for the food he consumes. If it is attempted, however, to make the lunch service, particularly in the elementary schools, entirely self-supporting—that is, to cover the cost of labor and administration as well as of food—the best results will not be secured. The prices charged will have to be so high as to keep from the service many children who are most in need of it. Moreover, there is good reason for charging the cost of administering the lunch and the labor to education, calling upon the community to meet such expenses. It has been clearly shown that the lunches can be made educational, and if they perform an educational service the community and not the individual child should be made to bear the expense of this service.

THE PROVISION OF FREE MEALS.

The principle that every meal must be paid for is a sound one and ought not to be departed from. To supply free meals indiscriminately is bad for the children and for the character of the service as well. Children who can not afford to purchase their own meals should be provided with such meals either by private charitable agencies or through funds appropriated by the city government specially for that purpose. The provision of free meals for the child should be regarded only as an extremely temporary expedient which should be followed up by close investigation of the home. If such investigation indicates the family is too poor to supply adequate food, the provision of relief should be made directly to the family and not to the child. All that is necessary after all is to insure that no child is deprived of the school meal simply because of the poverty of his parents, but the best social practice indicates that the relief should be made to the family as a unit and not to the child.

THE PUBLIC CONTROL OF SCHOOL FEEDING.

Experience both in Europe and America indicates that school feeding, to be done efficiently, must be placed in the hands of the local educational authorities. We have seen that while school feeding usually has been initiated through private effort, it has almost universally been transferred to public control. It is significant that in all the cities in America where school feeding has been developed at all extensively the work is now done entirely by the board of education. New York, Chicago, and Philadelphia have intrusted this work entirely to the department of education, while Los Angeles, Louisville, and other cities also maintain an extensive lunch service under public control.

The private operation of school lunches fails to achieve the best results because private committees usually lack sufficient funds to extend and maintain the service adequately. Moreover, it is difficult for a private organization to receive the cooperation of the teaching staff, essential to making the school lunches thoroughly educational. Indeed, the private control of school lunches is justified only as an experiment to demonstrate that such work is needed and to discover what are the best methods of organization and administration. Since experimentation of this kind has already been done, it is folly for any community to repeat such experiments.

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